

1/6/16

"Ask not what your country can do for you, ask what you can do for your country." - John F. Kennedy

HW: Text page 224 #30-44 even
Test 3 on Friday 1/15

AIM: How do we write quadratic equations given the roots?

Warm Up:

1) Solve for all values of x

$$x^2 + 2x - 15 = 0$$

$$(x-3)(x+5) = 0$$

$$x = 3 \quad | \quad x = -5$$

$(x-3)(x+5) = 0$	
$x-3 = 0$	$x+5 = 0$
$+3 \quad +3$	$-5 \quad -5$
$x = 3$	$x = -5$

Alt:

$$x^2 + 2x + \boxed{1} = 15 + \boxed{1}$$

$$\frac{2}{2} = 1 \quad \pm \sqrt{(x+1)^2} = \pm \sqrt{16}$$

$$1^2 = 1$$

$$x+1 = \pm 4$$

$$\begin{array}{r} -1 \quad -1 \\ \hline x = -1 \pm 4 \end{array}$$

$$-1 + 4$$

$$(3)$$

$$-1 - 4$$

$$(-5)$$

In this class, we will only encounter quadratic equations with **rational coefficients**. What does this mean?

$$ax^2 + bx + c = 0$$

a, b, c are rational numbers.

If $a + bi$ is a root, then $a - bi$ is also a root.

If $a + b\sqrt{c}$ is a root, then $a - b\sqrt{c}$ is also a root.

2. Using the solutions from the warm up, could we write a quadratic equation with those roots?

$$x = 3 \quad x = -5$$

$$\text{Sum} = 3 + (-5) = -2$$

$$\text{Product} = 3(-5) = -15$$

$$\text{Sum} = -\frac{b}{a}$$

$$\text{Product} = \frac{c}{a}$$

$$x^2 - (-2)x + -15 = 0$$

$$x^2 - (\text{Sum})x + (\text{Product}) = 0$$

3. Write a quadratic equation with integral coefficients whose roots are -3 and 4.

$$\text{Sum} = -3 + 4 = 1$$

$$x^2 - (\text{Sum})x + (\text{Product}) = 0$$

$$\text{Product} = -3(4) = -12$$

$$x^2 - 1x - 12 = 0$$

Don't forget = 0

(= whole #s Not Fractions)

4. Write a quadratic equation with integer coefficients whose roots are

$$\frac{3}{4} \text{ and } \frac{-3}{8}$$

$$\text{Sum} = \frac{3}{4} + \frac{-3}{8} = \frac{3}{8}$$

$$\text{Product} = \left(\frac{3}{4}\right)\left(\frac{-3}{8}\right) = -\frac{9}{32}$$

$$x^2 - \frac{3}{8}x - \frac{9}{32} = 0$$

$$32 \left(x^2 - \frac{3}{8}x - \frac{9}{32} = 0 \right)$$

LCD = 32
To get rid of the fractions!

$$32x^2 - 12x - 9 = 0$$